IHC SS files

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Memorandum for Holders
USIB-D-39.7/23
1 September 1967

UNITED STATES INTELLIGENCE BOARD

MEMORANDUM FOR HOLDERS OF USIB-D-39.7/23

SUBJECT : Committee on Documentation Report on Intelligence Data Handling Research and Development

REFERENCE : USIB-D-39.7/23, 16 August 1967

1. The CIA Member of USIB has proposed in the attached memorandum that, instead of the actions recommended by CODIB in the reference, USIB "refer the CODIB report to the new USIB committee on information handling when established for its use and further consideration."

USIB Action Requested

2. Board members are requested to advise the Secretariat by close of business 8 September of their concurrence in or other views on the alternate USIB action proposed by the CIA Member.

25X1A

[redacted]
Executive Secretary

Attachment

Basic CODIB paper approved, as amended by this memorandum for Holders, on 21 Sept and is reflected in USIB-M-486 - Secretary's Notes.

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SECRET

Attachment
Memorandum for Holders
USIB-D-39.7/23
1 September 1967

31 August 1967

MEMORANDUM FOR : Executive Secretary, USIB

SUBJECT : CODIB Report on Intelligence Data Handling Research and Development (USIB-D-39.7/23)

1. Your memorandum of 16 August 1967 (same subject as above) requests concurrence in or other views of USIB members on the recommendations of the referent report.

2. Instead of the actions recommended by CODIB, I suggest that USIB should refer the CODIB report to the new USIB committee on information handling when established for its use and further consideration.

[redacted] 25X1A

Rufus Taylor
Vice Admiral, USN
CIA Member, USIB

SECRET

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USIB-D-39.7/23
16 August 1967

UNITED STATES INTELLIGENCE BOARD

MEMORANDUM FOR THE UNITED STATES INTELLIGENCE BOARD

SUBJECT : Committee on Documentation Report on Intelligence Data Handling Research and Development

REFERENCES : a. USIB-D-39.7/6, 6 May 1964
b. USIB-M-322, 29 April 1964, Item 5
c. USIB-D-39.7/5, 16 March 1964

1. The enclosed report by the Committee on Documentation (CODIB) on its efforts "to define and describe goals for research and development to meet information processing needs within the Intelligence Community", which responds in part to USIB directives in reference a., is submitted for USIB consideration of the CODIB recommendations contained in paragraph 7, page 3, of [redacted] memorandum. This report is the seventh response to the USIB action at its meeting on 29 April 1964 (reference b.) approving as amended the CODIB recommendations on pages 20, 21 and 22 of the Stage I Report of the Staff for the Community Information Processing Study (SCIPS) (reference c.). 25X1A 25X1A

2. Specifically, as explained in paragraphs 2. and 3. of [redacted] memorandum, the enclosed CODIB report and the attached excerpts from the study undertaken by its Task Team VI (Intelligence Data Handling Research and Development) are intended as a response to Recommendation 4. e. of the final USIB-approved recommendations regarding the SCIPS Report which directed CODIB to develop "a community coordinated R&D program in the areas of non-numerical data processing, associative memories, and machine translation". This present action therefore is to discharge CODIB's task and to lay the groundwork for what it believes the next steps should be.

USIB ACTION REQUESTED

3. Board Members are requested to indicate their concurrence in or other views on the Recommendation in paragraph 7., page 3, of the

USIB-D-39.7/23
16 August 1967

attached CODIB report by completing and returning the vote sheet appended hereto by close of business 31 August 1967.

25X1A

Executive Secretary

Enclosures

CODIB-D-111/1.6/8
8 August 1967

UNITED STATES INTELLIGENCE BOARD

COMMITTEE ON DOCUMENTATION

MEMORANDUM FOR: United States Intelligence Board

SUBJECT : Intelligence Data Handling Research and Development

1. This is the seventh of a series of nine reports undertaken pursuant to USIB direction (USIB-D-39.7/6). In the task reported on, CODIB undertook "to define and describe goals for research and development to meet information processing needs within the Intelligence Community" (CODIB-D-111/1.6/3).

2. The CODIB Task Team (VI) organized to study this area did so in late 1965. However, as reported in our last annual report, CODIB directed its revision to cover additional ground. Since then extensive exchanges on this subject took place between Community representatives and the PFIAB/OST Joint Guidance and Evaluation [Knox Panel]. As the Board knows, no findings or recommendations of the Knox Panel have yet been made available to CODIB members on this or any other subject. During this period, we have noted a considerable increase in Community activity relating to data handling R&D, including an interagency exchange of information on programs undertaken.

3. This present action is to discharge CODIB's task and to lay the groundwork for what we believe the next steps should be.

4. The Task Team identified five critical R&D problems:

a. The need for each agency to have an R&D policy mechanism for formulating Intelligence Data Handling R&D objectives, which mechanism would also facilitate Community cooperation in this field.

b. The need for a greater Community awareness of information services of use to personnel working on intelligence data handling R&D.

c. The need for establishing improved means of communications between the analysts, who use information systems, and R&D personnel, who are charged with systems improvement.

d. The need for conducting experimental work on information handling systems in order to determine criteria for systems evaluation.

e. The need to again seek applications of advanced techniques and equipment to improve warning and indications capabilities.

5. In addition, a number of other no less important but perhaps less urgent matters were surfaced. These included: steps needed to improve the photo interpretation process; the need for disseminating technical information and for publishing organizational listings; the need for the construction of models; the need for matching sub-standard information processes with the available or prospective remedy.

6. In considering what action would now be useful, CODIB has noted the following:

a. The progress made by CIA in establishing its Intelligence Processing Research and Development Facility (IPRD).

b. The planning undertaken by DIA for establishing an Experimental Research Facility (ERF).

c. The experimental work in progress in the Community through USIB's Project COINS, CIA's Project CHIVE, and DIA's Project ANSRS.

d. The completion of the Joint Imagery Interpretation Group (JIIRG) report, and steps in progress towards implementing its recommendations.

e. The completion of the NIPE sponsored definitive study on Early Warning (Shute Report), and current Community action pursuant thereto.

f. The specific responsibilities for conducting SIGINT R&D currently assigned to NSA under NSCID #6, para. 7.b.(2), and for conducting imagery exploitation R&D currently assigned to NPIC under NSCID #8, para. 2.g.

g. The broad responsibilities for supervising all DOD R&D (including that undertaken by DOD intelligence components) assigned to DDR&E.

h. The experimental work in progress in the academic community through [redacted] 25X1

i. The great extent to which R&D in the information sciences, most having intelligence application, is sponsored and conducted by organizations outside the Intelligence Community.

j. The major involvement of NSA, NPIC, CIA, and DIA in upgrading their computer and associated systems.

7. Recommendations

In view of the above we recommend:

a. That USIB note this report.

b. That USIB defer further action with respect to information handling R&D pending the establishment of, and the receipt of recommendations from, the USIB committee on information handling (USIB-D-39.1/2; USIB-M-481, item 9). 25X1A

[redacted]

Chairman

Attachments

TAB A: Intelligence Data Handling Research and Development Potential (Appendix 2 of Task Team VI Report, CODIB-D-111.6/5, 30 January 1967).

TAB B: Task Team VI Recommendations (pp. 45-49 of Task Team VI Report).

TAB A
CODIB-D-111/1.6/8
8 August 1967

INTELLIGENCE DATA HANDLING RESEARCH AND DEVELOPMENT POTENTIAL

1. An Overview

The improvements and advantages potentially available to information handling activity through developments in the information sciences are most often described by a particular device or technique, affecting one part of the process. It is suggested that, before this is done, a more general view be taken of how the overall process is affected.

a. System Analysis. If advancements in information handling and automatic data processing techniques are to be applied successfully to a process, we must begin with a system analysis. This will place each element of the system in proper perspective, and then group the elements in a manner that will permit the system to accomplish its mission in an effective manner and with a minimum expenditure of resources. The analysis may start with a review of functions to be performed (definition, delineation, requirement); proceed through a definition, quantification and evaluation of the parameters inherent in the geography and timing of the system elements (data base, data routes, traffic rates and patterns, space and time relations, etc.); and finally, study the methods of implementation for optimum performance of the entire system. Quite often, so much is learned about system improvements from these first two steps (analysis of functional and space-time parameters) that the implementation analysis seems anticlimatic. A rigorous system analysis applied to Intelligence Data Handling may be similarly salubrious.

b. Simulation. System simulation is a powerful technique now available for gaming and evaluating the operation of a projected system, taking into consideration the specific hardware implementation, communications netting and contemplated space-time relationships. The availability of sophisticated compilers, simulation program routines and powerful general purpose processors makes possible the simulation of even complex system operations. Reasonable preparation time (weeks) and reasonable running time (hours) are usual. System parameters and configurations which are difficult to define can be varied in the simulation run for optimization analysis. The advantages of this system simulation technique increase directly with system complexities and uncertainties.

c. Data Reduction. When applied properly to massive information networks, new information handling techniques may accomplish as much good in data reduction as in data storage and retrieval. Data reduction can be far more than just convenient compilation and summarization. It can include pattern recognition. It can also include conversion of bulk data to more understandable graphics, such as maps. If the system designer remains ever conscious of the dangers of eliminating important data in the act of reducing data to more convenient, storable, and recognizable forms, the process of data reduction may be applied to great advantage.

d. Massive Network Practicality. For an information handling system which is large in size, and complex in its network of social interconnections, an irreducible minimum is encountered in the time it takes for an action to be processed through it, depending on the number of manual (human) transfer and terminal points that are encountered. This minimum time seems impervious to urgency, pressure or directive; and many of the evils of bureaucracy accrue from this feature of large systems. If large information systems tend to remain complex and cumbersome despite all efforts at system improvement, they can be made more practical and acceptable in operation by wise application of automatic data processing devices. Increased speeds and capabilities of information storage and retrieval, standardized approaches to information classification and formatting, and machine-aided manual activities are some of the approaches now available for accomplishing this objective. Greater speed of response, improved accuracy and reliability, capability for redundancy in data base and operations, even economy, can be obtained if the system is designed wisely. (And very little good, at great expense will result if done carelessly.) While the above are methods applicable to all information handling systems, research and development approaches more specifically tailored to the special needs of Intelligence Data Handling can be made.

e. System Experimentation. While system analysis and system simulation provide valuable insights, there are certain "realities" which can be introduced and evaluated only through some level of experimentation. These are, to a major degree, the effects of human factors, and, to a lesser degree, the limitations of practical communications. (It could be for these very reasons that the Prussian General Staff adopted their cynical observations that "No plan survives contact with the battle.")

The role of the human operator in a system remains sufficiently variable and unpredictable so as to defy simulation. It could only be gamed by using people. The effect of communications is a more subtle factor, and its value in system experimentation depends completely on how realistically it is introduced, i.e., availability of channels, realiability, error control, typical quality, capability for verification and authentication, vulnerability to accidental or deliberate interference, etc. So many systems as designed turn out in practice to be communications limited, that special pains to introduce practical features of communications in experimentation are warranted.

In experimentation it is not desirable or necessary to duplicate the entire system. A "single-thread" model is sufficient in which at least one of every type of subsystem element is contained. As indicated above, typical staffing and interconnections should be employed as far as possible.

f. System Evaluation. System evaluation can and should go well beyond investigation of system action under normal circumstances, it should help prepare for and accommodate the typical. If system experimentation is properly designed and executed, the evaluation can include such valuable insights as performance under adverse environment; the individual and cumulative effects of subsystem outages; the need for back-up procedures, manual or automatic, at particular system locations; the value of redundancy in data base and control; and the need for acknowledgement of critical transmissions. Designing for system survivability under adverse circumstances is admittedly an expensive feature, most often omitted from commercial systems. It seems warranted for Information Data Handling.

Among the many factors of human conduct to be evaluated in system experimentation, one of particular interest is the Error Generator within the system. Too often an ambiguous situation is resolved prematurely at a low echelon of information entry by a human operator who feels obligated by standard operating procedure, or forced by assigned information format, to make a clear choice. In an automated system this unwarranted "decision" is transmitted rapidly and widely through the system with little opportunity for review, serving to misinform and influence other decision. System evaluation should be particularly sensitive to opportunities for the introduction of errors, such as this, in the system design.

g. Information Display. Methods for Information Display have proliferated in recent years. Techniques are available for real-time, cathode tube display, direct and projected, from

computer memory stores. Such electronic symbol and raw video displays can be combined with film projections on the tube face. Dry film processing, photochromics, lenticular lens color methods, lasers and many other approaches add to the inventory. These techniques can best be applied to Information Data Handling within the framework of specific requirements.

Because methods have increased and improved, a very significant system impediment may arise, that of over-display. Surplus information, not bearing on the situation, or excess information, serving to repeat what is already present, might be presented. Surplus and excess information could definitely be deleterious to the decision maker, serving to slow him down and confuse him to an extent depending on the complexity of the problem faced and his own capabilities. This aspect of over-display warrants investigation in system experimentation.

Another potential limitation in information display could be a too-rigid assignment of standard formats. The same process that would permit the human operator to resolve an ambiguity without rational basis because he thinks such a resolution is expected of him by nature of the format, would prompt him to omit the entry of vital information because the format doesn't encourage it. Some compromise between format and permissivity must be evaluated in system design of information entry and display.

2. Developments in Techniques

Any attempt to describe pertinent developments in devices would be obsoleted by tomorrow's newspapers; moreover, device development is an industrial juggernaut moving fast enough without any further impetus. However, many general Information System techniques now in research and development are of considerable potential for improving Intelligence Data Handling and should be considered, particularly if specialized continuation is considered necessary. It may be observed that the techniques described below are independently interesting, but are closely interdependent for maximum exploitation.

a. Mechanized Language Translation. Work on MLT is widespread. It does not yet offer a substitute for the human translator, but does produce a translation which identifies subject matter, treatment of subject and descriptors which may permit classifying or cataloguing the document. It is believed that present MLT techniques could permit the "machine" to aid the human translator materially.

b. Character Recognition and Page Readers. Many successful, versatile and reliable character recognition devices have been designed. They have not yet resulted in similarly successful page readers because the "page" and the "page" format have not been standardized, and therefore the "page" handler cannot be designed economically. If a physical "page" arrangement were defined for Intelligence Data Handling, then a page reader could be readily developed for use in document translation abstraction, extraction, indexing and other forms of analysis.

c. Automatic Abstraction, Extraction and Indexing. Developments in large memory structures, content-addressable memories, list processors, and indexing techniques make automatic abstraction and extraction a realizable goal.

At the present state of research, abstracting is essentially an activity of extracting.

In automatic abstracting, an evaluation is performed on various portions of a document, in order to ascertain what portions are significant enough to be retained and what portions should be omitted.

Automatic abstracting uses documents in natural language at the input, and the system has to be capable of recognizing content indices in natural language text in order to yield at the output the required condensed representation.

The ordering system used for the storage of information is called a system of indexing, since it is comparable in its purpose, though not necessarily in its structure or efficiency, to the index of a file or library.

It is possible in the future that an automatic abstracting system may be capable of rewording the sentences extracted for retention in the abstract by generating natural text of its own.

Development of techniques and algorithms, utilizing advanced memory structures, coupled with efficiently organized file arrangements, indicate considerable promise in alleviating the current problems in the area of abstracting, extracting, and indexing. The specialized needs of intelligence data handling would be considerably improved by the development of these techniques.

d. Memory Structure. The field of large memory structures seems to be on the verge of revolution. The progress being made on very large, static (all-electronic) memories is so rapid that a conversion from the present, bulky, unreliable, electromechanical memories to low-cost, small size, all-electronic forms is predicted within the next five years. The potential

of detection and correlation techniques, mechanized language translation, and overall system reliability, to name a few areas, is great.

e. Speech Recognition by Machine. The recognition of speech by machine, in an unrestricted vocabulary from any speaker is a desirable, but, as yet, very distant goal. If however, the vocabulary were restricted to a limited set common to a particular function, and if a short period of adaptation or "training" on the speaker's voice characteristics were permitted, the goal of automatic recognition might be realizable. Further progress in this field awaits a better definition or requirements.

f. Compiler, Query Language and Natural Language Developments. The transitions from machine languages to assembly languages to compiler languages in recent years have made the preparation of machine programs successively simpler (and the design of machine languages much more difficult). The recent introduction of query languages permits direct access to a processor for immediate man-machine intercommunication without the prior preparation and debugging of a program. It is expected that work on languages will aim at a "natural" query language similar to ordinary conversational languages. While a "natural" query language still seems a distant goal, the achievement of less "unnatural" query languages is assured. This would permit greater freedom of action in man-machine interplay and could make a significant contribution to Intelligence Data Handling in machine-aided file searching, machine-aided analysis, and other areas. Development continues in the area of special purpose programming systems. Problem oriented languages solve specific problems, have increased flexibility and ease of use precisely because the problem areas addressed are extremely narrow and specific.

g. Time Sharing. Significant accomplishments have been achieved in the area of computer time-sharing. Utilizing software techniques, the computing system has the ability to be accessed simultaneously by a large number of separate users. A time-sharing computer can be viewed as a kind of public utility from which any user can draw whatever computational power he might need at any time without delay or difficulty.

A prime requirement for time-sharing is fool-proof memory protection whether it be done in software or hardware. Notable accomplishments in time-sharing have been the development of proper algorithms for scheduling, development of routines capable of restoring programs interrupted for continuation

processing, and the development of sufficiently sophisticated executive routines to minimize delay time experienced by the user between his input and the system's response.

25X1 Project [ ] is the most widely known time-sharing system, having at its heart a programming and executive system which allows for multiple user access while also permitting conventional batch processing loads to be run. The [ ] system will be 25X1
25X1 connected shortly to the [ ] networks, operated [ ] reaching approximately 60,000 teletypes. The TELEX network operated 25X1
25X1 by [ ] will provide access from terminals in Europe as well as in the United States.

Long distance access into a time-sharing computer system can be considered to be an important information data handling potential for the Intelligence Data Handling.

h. File Structure Organization. Limited advances have been made in the area of file structure organizations for large dynamic information retrieval systems. In the past this area has received limited attention, but as data processing equipments become more sophisticated and requirements for specialized information become more complex, techniques for improved retrieval through advanced file structures and data arrangements will be required.

Systems exist which utilize list processing techniques wherein addressing indexes in the form of trees provide access to the main file, which in turn can be accessed by different types of descriptors.

Responses to information retrieval requests can be improved by developing fast algorithms to take advantage of advanced file organizations. Initial results on associative processing techniques utilizing associative file arrangements show substantial promise for improving user response times.

Optimal file structures for information classification and formatting of typical application areas can improve the presently limited capability and usage of query type languages. Considerable investigation is required to achieve results that could be useful for enhancing this segment of intelligence data handling.

i. Generalized Data Management Systems. Recent developments in the area of generalized data management systems have emphasized the inclusion of general purpose programming as well as

job specific programming, user-on-line techniques as well as special purpose languages, and, if possible, making the resultant design time-sharing and into a single operating system.

Two such systems, [redacted] have attempted to construct, within the confines of one computer system environment, programs which incorporate the sophistication and power of generalized executive routines, the job specific concentration exhibited by the functional systems, the flexibility and power of user-on-line systems, the narrow band specificity of problem oriented languages and, to a lesser extent, the special sense of generality implied by time-sharing. 25X1

j. Pattern Recognition. Techniques for the improvement of pattern recognition devices have improved considerably in the past few years. Much of the early work was based on using patterns, contained digitally within a computer, which could be used as a template to compare the optically-scanned input pattern. Multi-font alphanumeric printed characters can now be interpreted by pattern recognition devices. Initial results in the interpretation of Chinese ideograms is being achieved.

Recent breakthroughs have established the first operational adaptive machine for pattern recognition. Called [redacted] it was designed by [redacted] for the Electronics Command. Basically, it is a data processing machine, using learning or adaptive techniques, composed of an organization of fixed and adaptive networks that process, in real time , large quantities of information in a parallel statistical manner. 25X1 25X1

A unique optical pre-processor for adaptive machines, which will filter out unwanted complicated background information and only transmit the small amount of information of interest to the adaptive system is under study.

A significant amount of research and development is required 1) to improve the operational speed of pattern recognition devices; 2) lower the cost of the devices; and 3) increase the accuracy of the devices by several orders of magnitude, in order to achieve the operational usefulness desired for Information Data Handling.

k. Document Handling, Control, and Dissemination. Progress in the area of document storage and retrieval is continuing at a slow pace, but is beginning to show signs of acceleration as researchers develop operational techniques and comprehend the complexity of field.

Research is underway on the application of machine methods of storage and retrieval to the literature of a number of specific application areas. The three major areas in which the human being plays a singular or supporting role which must be considered in the man-machine interface are: the selection, processing, and searching of recorded documents.

In the selection area one must make value judgments that the material chosen will be of continuing interest and that the proper setting of limits of relevance will assure that only pertinent documents are selected.

Processing can be divided into three decision elements: selection of abstracting method, depth of document analysis, and control of terminology. Compromises are required in each of these element areas as well as in the overall areas in order to operate an efficient, meaningful system.

The area of searching also requires a considerable amount of preliminary human endeavor. Questions are usually structured logically, using various Boolean functions.

The timely and accurate dissemination of documents, abstracts, extracts, etc. to the requestor is another problem area not efficiently automated.

Researchers have begun the study of the development of fundamental theory of documentation. Work is still required that will lead directly to improvement in methods of searching, document analysis, and to an increase in the general efficiency in the system. Continued basic research in the development of information retrieval theory is a requirement not only to satisfy the needs of business, scientific research, library service, but also most importantly, to improve the voluminous, myriad applications of Intelligence Data Handling.

1. Fragmentary Data Analysis. Achievements in the area of predictive calculations have been increasing at a moderate rate. Considerable progress has been made in the understanding and use of Markov chains, queuing theory, Monto Carlo methods, stochastic and probabilistic computations, and wargaming.

Estimates, indicators, and warnings based on fragmentary data analysis, might provide Intelligence Data Handling with timely speculative information required for decision making.

A significant program to analyze and define the needs and application areas for intelligence data handling requiring predictive calculation methods is necessary in order to take advantage of these mathematical techniques.

TAB B
CODIB-D-111/1.6/8
8 August 1967

EXCERPT FROM REPORT OF CODIB TASK TEAM VI
INTELLIGENCE DATA HANDLING RESEARCH AND DEVELOPMENT

VII. Recommendations

A. Previous sections of this report contain numerous conclusions which, because of their specificity, could be repeated verbatim here as recommendations. The Task Team has decided, however, to focus attention on five primary recommendations which ought to be implemented immediately as first steps toward generalized improvement of IDH-R&D. The five selected recommendations are not internally ranked with respect to importance or urgency since the Task Team believes all of them should be adopted. However, there is no restrictive interdependence and any combination of them may be independently adopted. In order that this section can be somewhat self-contained, each recommendation is accompanied by a cursory discussion; detailed discussion and back-up data are contained in the preceding sections of this report.

B. Recommendations for Immediate Implementation

1. USIB (via) CODIB Should Encourage Each USIB Member Agency or Department to Identify an R&D Policy Mechanism Within its Own Organization.

The identification of such policy mechanism for formulating IDH-R&D objectives and policies assumes high priority. Without such groups there is nothing to which the accomplishment of IDH-R&D projects can be related or addressed. Detailed discussions of such mechanisms and the need for them are contained in previous sections of the report (See Section II for details).

2. Coordinated IDH-R&D Actions Should Be Initiated in the Area of Warning and Indications (Predictive Calculations).

More allocation of resources -- both funding and Intelligence Community personnel -- should be directed into improving our warning and indications capabilities as this is one of the foremost functions of intelligence (See Section II. B. 1a). Early expensive failures in this field

of IDH-R&D no doubt have resulted in "burnt fingers"; but both techniques and equipment have since improved, and new efforts should be undertaken. Past failures must provide an educational background in avoiding the repetition of previous pitfalls. Efforts undertaken must be coordinated on a Community basis and not be isolated undertakings of a single agency. The input data for warning and indications are recognized as the responsibility of several USIB component agencies. CODIB should assist NSA, CIA and DIA to undertake some coordinated actions.

3. Funding Should be Provided for Preparation of a Report Listing Information Services of Use to the USIB IDH-R&D Community.

A comprehensive report is needed which would list those information services, either sponsored by the Government or which are available by other means to members of the Intelligence Community and which contain information of use to the USIB IDH-R&D community. The report should include details concerning usage of listed information services. The production of the report should be followed by an R&D effort aimed at determining improvement or changes in the information usage patterns of members of the USIB R&D community as a result of the "forced-feeding" of knowledge concerning available information services via dissemination of the subject report. The Task Team considers it unnecessary to conduct a survey of information usage patterns within the USIB R&D community prior to distribution of the report but very worth-while subsequent to distribution (See Section II). The report would have to be contracted out to an outside group and would require, in addition, the active involvement of selected members from the USIB Community. The report and subsequent survey should not cost over $150,000 for a nine months effort and means for funding should be recommended by CODIB (See Section II).

4. An Evaluation of Two Different Types of IDH Systems Should be Conducted to Determine and Establish Methodology Criteria.

It is proposed that two different types of IDH systems now in existence be singled out and selected for formalized experimentation and/or evaluation. Inasmuch as this has never been done before, there are presently no authoritative criteria for determining what constitutes a reasonable IDH system. In the past, IDH systems have been

developed to meet recognized requirements, but without the benefit of established guidelines to insure that the requirement was fulfilled. Consequently, there is an urgent need for CODIB to recognize the need for, and endorse experimental evaluation of at least two different types of existing systems by USIB member agencies. Such systems might include a document handling system, a real time warning and indications organization or a biographic retrieval system.

It is anticipated that these evaluations will be costly both in people and resources, since it will be a first-of-a-kind experience and will demand more diversity of competence of both USIB Community participants and contractual personnel than most R&D efforts. It is estimated that the first attempt should require about two years per system costing about $300,000 for each system. This is in addition to the costs covering USIB Community participants who will have to be assigned to the tasks. Considering the extremely large amounts spent in the past on unsuccessful IDH systems developments, the cost is not considered excessive. Rather, the cost is justified simply as a protective mechanism against further proposed system design and development efforts known intuitively to be useless before initiation but for which there is no technical foundation upon which to judge their inappropriateness (See Section III).

5. Establish a Feed-Back Mechanism Between Finished Intelligence Users and Producers and the IDH-R&D Community.

There is presently no established procedure whereby producers of finished intelligence can have their knowledge of general shortcomings in existing operational procedures, practices and techniques translated so as to determine the most rewarding areas of exploitation in IDH-R&D. Such a translation requires inter-personal communication between users and producers of intelligence and IDH-R&D personnel. No satisfactory mechanism exists to measure and make known the results of good or bad usage procedures of existing IDH capabilities in the production of finished intelligence or intelligence estimates. A mechanism is needed (an informal review group is recommended), which would determine whether or not the IDH capabilities were adequately exploited and good usage made of all the available data.

The R&D group would encourage feed-back analyses from the producers of finished intelligence to the IDH-R&D policy mechanism for further study to uncover faults and improve IDH capabilities. This would have many beneficial results to the Intelligence Community as a whole, resulting in improved IDH capabilities including equipment, techniques and personnel. It is recommended, therefore, that means be provided for finished intelligence producers to work more closely with IDH-R&D groups in order to improve IDH systems. It is believed that the best possible improvement would result from the closer working relationship between finished intelligence producers and IDH-R&D personnel afforded by the existence of an informal review group. However, there is need for an initial analysis to determine feasible feed-back techniques. This will require the part-time services of three to five experts from the USIB IDH community for about one year as well as the full-time assistance of two outside experts at a cost of approximately $75,000 (See Section II).

C. Other Recommendations

1. Following is a brief enumeration of other, more narrowly defined actions which the Task Team recommends be initiated:

a. Establish a formalized reporting mechanism under USIB sponsorship to disseminate IDH-R&D technical and planning information within the Community. The notion of a Central Register service for this information should be considered seriously.

b. Publish an agreed-upon organization listing of the IDH-R&D community.

c. Publish a phone directory of IDH-R&D personnel showing their recognized specialties and areas of interest.

d. Take the following steps to improve the photo interpretation process:

(1) Provide formal descriptions of both utilized and feasible procedures for photo interpretation.

(2) Evaluate and experiment with PI procedures that can be formally described.

(3) Determine critical areas where procedure changes or automated aids will alleviate the problems and initiate the required R&D.

(4) Put more emphasis on research into the "human factors" aspects of photo interpretation.

(5) Determine the essential characteristics of various types of photo interpretation and initiate R&D to effect improvements.

(6) Determine improved instructional techniques for photo interpreters.

(7) Improve the document and information storage, handling and retrieval aids available to photo interpreters.

e. Initiate a community-wide program to prepare models of selected important portions of the Intelligence Community as a technique for determining bottlenecks, gaps or deficiencies in the intelligence process.

f. Initiate a project to define and perhaps re-label IDH processes, determine those processes critical to different intelligence application and which need improvement, categorize on-going IDH-R&D efforts so as to identify which processes will be improved by the accomplishment of these efforts, and recommend R&D efforts to improve those processes which are not being improved by on-going R&D.